

REMARKS/ARGUMENTS

Claims 1-18 remain pending in this application. No claims are amended or canceled.

Embodiments in accordance with the present invention relate to methods for manufacturing a mask having an opaque edge structure comprising a carbon bearing material:

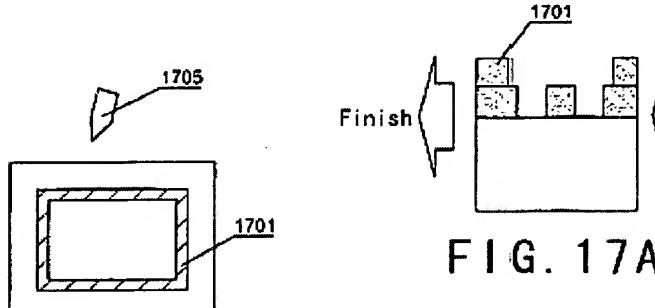


FIG. 17A

FIG. 17B

the method forms a border 1701 along the periphery 1703 of the patterned mask region, as illustrated by Figure 17. In a specific embodiment, the border is a deposited (carbon or chrome) material. The deposited carbon material is in a C<sub>12</sub>, C<sub>13</sub>, C<sub>14</sub> state. The deposited carbon material has a width of 4800 microns, a thickness of 50 nm ~ 300 nm, and a length surrounding the periphery of the mask region. Depending upon the embodiment, certain techniques can be used to deposit the carbon material. As merely an example, the carbon material can be deposited using a focused ion beam ("FIB") tool 1705 (see Figure 17A) . . . .

(Emphasis added; ¶[59])

Pending independent claims 1 and 11 accordingly recite as follows:

1. A method for manufacturing a mask for integrated circuit devices, the method comprising:
  - providing a quartz substrate having a surface, the quartz substrate comprising a thickness;
  - forming a MoSi film overlying the surface of the quartz substrate;
  - patterning the MoSi film overlying the quartz substrate to form a mask pattern; and
  - forming an opaque edge structure comprising a carbon bearing material on a portion of the surface around a peripheral region of the mask pattern; whereupon the opaque edge structure has a light transmittance ranging from about 0% to about 3%. (Emphasis added)

\* \* \*

11. A method for processing integrated circuit devices, the method comprising:

providing a mask structure, the mask structure comprising a quartz substrate having a surface, a patterned MoSi film overlying the surface of the quartz substrate to form a mask pattern, and an opaque edge structure comprising a carbon bearing material on a portion of the surface around a peripheral region of the mask pattern; and

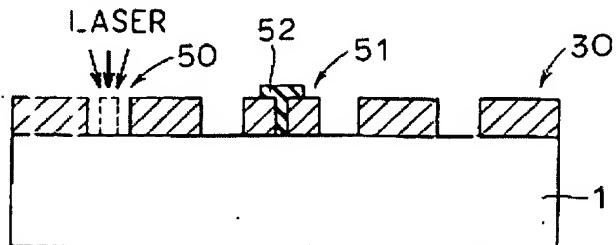
using the mask structure for applying a pattern onto a photosensitive material overlying a semiconductor substrate. (Emphasis added)

The Examiner has rejected the pending claims as obvious under 35 U.S.C. §103 based upon the reference combination of U.S. published patent application document 2004/008678 to Shiota et al. ("the Shiota Application"), in view of U.S. Patent No. 5,474,864 to Isoa et al. ("the Isoa Patent"). These claim rejections are overcome as follows.

As a threshold matter, the Examiner is respectfully reminded that a first requirement to establish a *prima facie* case of obviousness is that "the prior art reference (or references when combined) must teach or suggest all of the claim limitations." (MPEP 2143). Here, the Examiner has correctly acknowledged that the Shiota Application - the primary reference being relied upon - fails to teach or suggest all of the elements of the pending claims. Specifically, the Shiota Application fails to disclose "an edge structure comprising a carbon bearing material on a portion of the surface around a peripheral region of the mask pattern." (Office Action Mailed October 31, 2005, page 4)

In recognition of this lack of teaching, the Examiner has combined the Shiota Application with the Isoa Patent. However, the latter reference also fails to teach or even suggest forming the mask edge structure of carbon bearing material in the manner of the claimed embodiments.

In particular, the Examiner has relied upon Figure 26 and accompanying text of the Isoa Patent to provide the teaching that is absent from the Shiota Application. This Figure 26, however, describes only the repair of defects present in a mask:



Specifically, Figure 26 of the Isao Patent shows repair of a first type of mask defect (50) comprising remaining mask material, by the application of a laser. Figure 26 also shows repair of a second type of mask defect (51) comprising a pin hole, by the formation of carbon (52) therein.

The portion of the Isao Patent specifically relied upon by the Examiner thus teaches only repair of defects in a mask. Neither this, nor any other portion of the Isao Patent, teaches or even suggests forming an opaque mask edge structure from carbon in accordance with the claimed embodiments.

In view of the failure of the Shiota Application and Isao Patent references relied upon by the Examiner to teach each and every element of the pending claims, it is respectfully asserted that these claims cannot be considered obvious in view of those references. Continued maintenance of the obviousness claim rejections is improper, and these claim rejections should be withdrawn.

Based on the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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